Document details

Back to results | 1 of 1

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Scattering of a two-soliton molecule by Gaussian potential barriers and wells (Conference Paper)

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Abstract

View references (18)

Two anti-phase bright solitons in a dipolar Bose-Einstein condensate can form stable bound states, known as soliton molecules. In this paper we study the scattering of a two- soliton molecule by external potential, using the simplest and analytically tractable Gaussian potential barriers and wells, in one spatial dimension. Theoretical model is based on the variational approximation for the nonlocal Gross-Pitaevskii equation (GPE). At sufficiently low velocity of the incident molecule we observe quantum reflection from the potential well. Predictions of the mathematical model are compared with numerical simulations of the GPE, and good qualitative agreement between them is demonstrated. © Published under licence by IOP Publishing Ltd.

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